

**Cancer stem cells: models and concepts.**

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**Public Summary:**

**Scientific Abstract:**

Although monoclonal in origin, most tumors appear to contain a heterogeneous population of cancer cells. This observation is traditionally explained by postulating variations in tumor microenvironment and coexistence of multiple genetic subclones, created by progressive and divergent accumulation of independent somatic mutations. An additional explanation, however, envisages human tumors not as mere monoclonal expansions of transformed cells, but rather as complex tridimensional tissues where cancer cells become functionally heterogeneous as a result of differentiation. According to this second scenario, tumors act as caricatures of their corresponding normal tissues and are sustained in their growth by a pathological counterpart of normal adult stem cells, cancer stem cells. This model, first developed in human myeloid leukemias, is today being extended to solid tumors, such as breast and brain cancer. We review the biological basis and the therapeutic implications of the stem cell model of cancer.

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